A Tale of Disparity: The Effects of COVID-19 Budget Cuts on the Growing Education Gap in NYC Public Schools

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Abstract

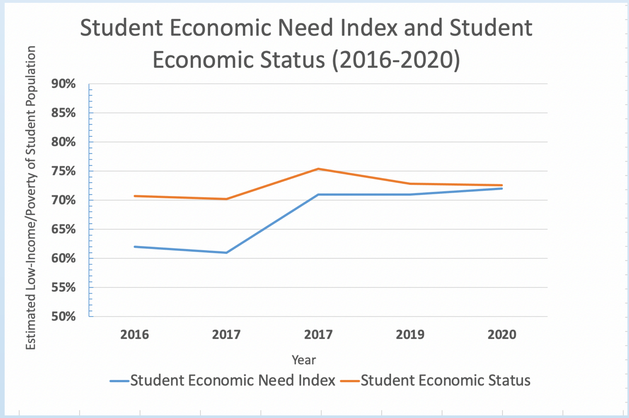
- The economic disturbance caused by the COVID-19 pandemic has resulted in budget cuts to education funding by New York City officials for the 2020-21 budget year. The New York Department of Education (NY DOE) proposed $581.5 million in budget cuts to the department's fiscal 2020-21 budget, a total of 3.5% of the department's tax-levy funding, which includes a $100 million cut from the $11 billion Fair Student Funding (FSF) budget.
- Since 2007, the Fair Student Funding is the primary funding source for essential school operations and is designed to encourage equitable funding across the district
- Research exists showing implicit inequalities in the allocation of FSF leading to disparities among schools; however, little research exists on the funding program's ability to help students succeed during economic crises.
- **What is the relationship between student need and their performance scores?**
- **What are the implications of COVID funding cuts on the growing education gap in NYC Public Schools?**
- We use data primary data from the Department of Education's Demographic Snapshot to analyze NYC student's current economic conditions.
- Next, we analyze data from test scores in High School and Grades 3-8 math and English and determine a relationship between the two datasets.
- Lastly, we propose recommendations on how New York City school systems may lessen the growing learning disparities between economically disadvantaged and non-disadvantaged students during the COVID-19 pandemic.

Introduction

- In 2007, NYC Department of Education implemented Fair Student Funding to increase equitable funding and empower school leaders. Fair Student Funding provides:
  - a flat funding of $200,000 per school;
  - a per-capita student funding adjusted for grade; and
  - applies a needs-based weight depending on certain factors like economic need, special education, English learner status, and special portfolio school.[9]
- COVID-19 is predicted to exacerbate the income and education gap for low-income students.[4]
- Comprehensive research exists on the connection between student's economic status and their performance.[4, 7, 8, 9]
- In New York's proposed budget for the Department of Education's 2020-21 budget year, the city proposes $100 million cut to Fair Student Funding, the primary discretionary funding source for schools.[8]
- This study aims to examine the relationship between economic conditions and student outcomes using proficiency rates from Regents standardized testing and estimation of low-income rates.
- We hypothesize that an increase in estimated low-income populations will lead to a decrease in the proficiency rates for economically disadvantaged students.

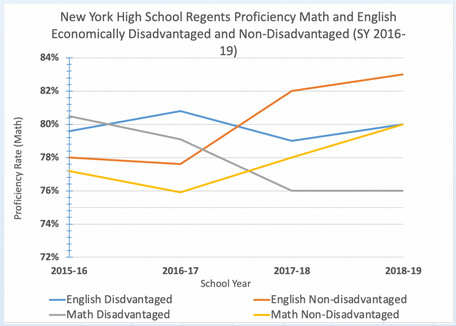
Methodology and Data Analysis

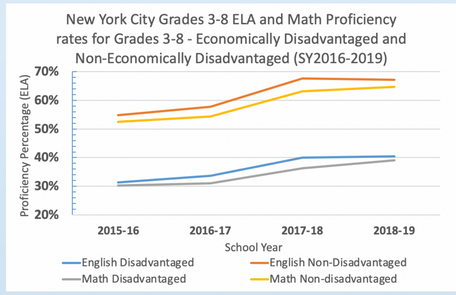
- We use primary data from the Department of Education's English Language Assessment (ELA) and Mathematics Testing from 2016-2019.[2, 3]
- Scores are split between Grades 3-8 and High School (9-12).[2, 3]
- We choose proficiency scores for Math and Reading as the metric for student success because these are the only tests issued by the state that are required for graduation.[5]
- The two estimates used determine low-income status mentioned in the data for student performance on Grade 3-8 and High School Regents Proficiency test (Proficiency tests), the Student Economic Need Index (SENI) and the Student Economic Status (SES).[1, 2, 3]



This graph shows the estimated percentage of low-income populations for the Student Economic Need Index and Student Economic Status for 2016 through 2019.

- The Student Economic Need Index is an estimate of the percentage of students facing economic hardship. A student's economic need is calculated as 1.0 if they qualify for assistance under the Human Resource Administration and other economic assistance indicators.
  - If the student does not qualify under any of these definitions, the student is assigned a score equal to the percentage of families in their area that make less than the poverty level. [2, 3]
- The Student Economic Status is another metric that estimates the percentage of students in "poverty" using qualification for free or reduced lunch and eligibility for Human Resources Administration benefits as indicators for poverty.[2, 3]





Student scores are categorized as "Economically Disadvantaged" for student populations that are within the threshold for the Student Economic Need Index and Student Economic Status.

- We use Pearson's Product-Moment Correlation Coefficient (*r*) to determine the linear correlation between the estimated percentage of students in low-income/impoverished households and the proficiency rate for economically disadvantaged students. Relationships range between -1 and 1, with 0 indicating no linear relationship. A *r* with |0.7| is considered strong, with a relationship over |.9| considered a very strong relationship. To find *r*,

$$r = \frac{\sum(x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum(x_i - \bar{x})^2 (y_i - \bar{y})^2}}$$

where,

r = correlation coefficient
x_i = values of the x-variable in a sample
$\bar{x}$ = mean of the values of the x-variable
y_i = values of the y-variable in a sample
$\bar{y}$ = mean of the values of the y-variable

Pearson's Correlation for Student Economic Status and Economically Disadvantaged Student Proficiency Rates SY 2016-2019			
Economically Disadvantaged	Sample mean (x̄)	Sample mean (ȳ)	Correlation coefficient (r)
Grades 3-8 English	0.72	0.34	0.7625403017
Grades 3-8 Math	0.72	0.34	0.6773830709
High School English	0.72	0.80	-0.8334780287
High School Math	0.72	0.78	-0.7858878207

Pearson's Correlation for Student Economic Need Index and Economically Disadvantaged Student Proficiency Rates SY 2016-2019			
Economically Disadvantaged	Sample mean (x̄)	Sample mean (ȳ)	Correlation coefficient (r)
Grades 3-8 English	0.66	0.96	0.43
Grades 3-8 Math	0.66	0.34	0.95
High School English	0.66	0.80	-0.58
High School Math	0.66	0.20	-0.94

Results

- Grade 3-8 English Language Assessment (ELA) and math proficiency scores increase positively overtime, but there is a large difference in proficiency between disadvantaged and non-disadvantaged students of 25.43 percentage points.
- The correlation coefficient for high school English and Math shows a negative linear relationship for both the SENI and SES.
  - The SENI shows a very strong correlation for high school math and grade 3-8 math of -0.94 and 0.95 respectively.
  - The SES shows a strong correlation between grade 3-8 English (0.76), high school math (-0.78), and high school English (-0.83).
- For Grade 3-8 Mathematics and English Proficiency the correlation coefficient is positive for both the SENI and SES.

Conclusion

- This analysis partially confirms our hypothesis regarding the inverse relationship between low-income/impoverished household estimates and proficiency rates for the economically disadvantaged population.
- A strong inverse relationship exists for both low-income/ poverty estimates for High School Math; however, only the SES showed a strong correlation with High School English.
- Contrary to our hypothesis, Grades 3-8 proficiency related positively with estimated need, although the average difference in proficiency between disadvantaged and non-disadvantaged students was around 25 percentage points, or students were 75% less proficient than the non-economically disadvantaged group.
- These results may indicate differences in remediation outcomes between elementary and high school students; however, further research is needed to determine the causal relationship of the underlying data.
- Our small sample size and use of aggregated data obfuscate the trends present in specific segments within the disadvantaged and non-disadvantaged communities.
- We recommend that during the COVID-19 pandemic, state and local governments not defund Fair Student Funding if the percentage of economically disadvantaged students is increasing. Instead, the Department of Education should reconsider funding schedules to ensure the student achievement gap does not widen.

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